

REMARKS

This Amendment is fully responsive to the non-final Office Action dated September 2, 2009, issued in connection with the above-identified application. Claims 1-18 are pending in the present application. With this Amendment, claims 1, 2, 5, 7, 9, 10, 13 and 15-18 have been amended; and claims 19-27 have been added. No new matter has been introduced by the amendments made to the claims or by the new claims added. Favorable reconsideration is respectfully requested.

To facilitate the Examiner's reconsideration of the present application, the Applicants have provided amendments to the specification and the abstract. The changes to the specification and the abstract include minor editorial and clarifying changes. Replacement portions of specification and a new abstract are enclosed. No new matter has been introduced by the amendments made to the specification and the abstract.

In the Office Action, the Examiner objects to the specification for several reasons. First, the Examiner objects to the abstract because of the format. The Applicants have provided a new abstract that is a single paragraph, less than 150 words and does not use any legal phraseology. Withdrawal of the objection to the abstract is respectfully requested.

Second, the Examiner objects to the title as being non-descriptive. Accordingly, the Applicants have amended the title to read instead "COMMUNICATION SYSTEM AND METHOD FOR DISTRIBUTING CONTENT," which is believed to be descriptive of the present invention, as claimed. Withdrawal of the objection to the title is respectfully requested.

Third, the Examiner alleges that the specification fails to include proper antecedent basis for certain limitations in the claims. For example, the Examiner states that the limitation "an IP address included in the IP Multicast frame is set as an address at a network layer," is not clearly supported by the Applicants' disclosure. However, the Applicants assert that the limitation "an IP address included in the IP Multicast frame is set as an address at a network layer" noted by the Examiner (e.g., in claim 3) is clearly supported in at least ¶[0069] and ¶[0106] of the Applicants' disclosure.

The Examiner also alleges that the limitation "said first content receiving unit is operable to extract from the Multicast frames transmitted via said first communication path a Multicast frame which stores a content corresponding to the content request received by said first content request receiving unit" is not supported by the Applicants' disclosure. However, the Applicants

assert that the limitation “said first content receiving unit is operable to extract from the Multicast frames transmitted via said first communication path a Multicast frame which stores a content corresponding to the content request received by said first content request receiving unit” noted by the Examiner (e.g., in claim 15) is supported in at least ¶[0084] of the Applicants’ disclosure.

For example, the Applicants’ disclosure indicates that the first communication unit 102a which receives the distribution requests of the programs A1, A2, and A3 by the IGMP request selects only frames of the programs A1, A2, and A3 among all program frames transmitted by IP Multicast via the first communication path 101, and distributes the selected frames to the second communication unit 104a.

Based on the above discussion, the limitations noted by the Examiner are fully supported by the Applicants’ disclosure. Withdrawal of the objection to the specification is respectfully requested.

In the Office Action, the Examiner objects to claim 16 because the claim recites “a second content receiving unit operable to receive the Multicast frame” in lines 25-26. The Examiner alleges that the term “Multicast” in the claim should be changed to “Unicast.” The Applicants have amended claim 16, as suggested by the Examiner. Withdrawal of the objection to claim 16 is respectfully requested.

In the Office Action, Fig. 1 has been objected to for failing to include a “Prior Art” legend. The Applicants have provided a replacement sheet for Fig. 1. The replacement sheet indicates that Fig. 1 is “Prior Art.” Withdrawal of the objection to Fig. 1 is respectfully requested.

In the Office Action, claims 1, 8, 9, 13 and 15-18 have been rejected under 35 U.S.C. 103(a) as being unpatentable over Tomohiko (European Publication No. 1134933, hereafter “Tomohiko”) in view of Sharony (U.S. Publication No. 2004/0057459, hereafter “Sharony”); and claim 18 has been rejected under 35 U.S.C. 103(a) as being unpatentable over Tomohiko in view of Sharony, and further in view of Wakai (U.S. Patent No. 5,973,722, hereafter “Wakai”).

The Applicants have amended independent claims 1 and 15-18 to more clearly distinguish the present invention from the cited prior art. Independent claim 1 (as amended) recites the following features:

“[a] communication system comprising:

a first communication device; and
a second communication device,

wherein said first communication device includes: a first content receiving unit operable to receive, via a first communication path, a Multicast frame which stores a content;

a conversion unit operable to convert the received Multicast frame into a Unicast frame addressed to said second communication device; and

a first content transmission unit operable to transmit the converted Unicast frame to said second communication device via a second communication path, based on a protocol having a re-transmission processing, and
said second communication device includes:

a second content receiving unit operable to receive the Unicast frame transmitted via said second communication path from said first communication device based on the protocol having the re-transmission processing,

wherein the re-transmission processing is performed at a layer lower than a layer of a communication protocol defining the Multicast frame. (Emphasis added).

The features emphasized above in independent claim 1 are similarly recited in independent claims 15-18 (as amended). That is, independent claims 15-18 have been amended to point out that “the re-transmission processing is performed at a layer lower than a layer of a communication protocol defining the Multicast frame,” as recited in independent claim 1. Additionally, the features emphasized above in independent claim 1 (and similarly recited in independent claims 15-18) are fully supported by the Applicants’ disclosure (see e.g., ¶[0068] and ¶[0073]).

The present invention is distinguishable from the cited prior art in that a communication system (or method) includes a first communication device that converts the received Multicast frame into a Unicast frame and transmits the converted Unicast frame to a second communication device based on a communication protocol having a re-transmission processing. A layer of the communication protocol having the re-transmission processing is a layer (for example, Data Link layer; a MAC layer) lower than a layer (Network layer) of a communication protocol (namely, IP) defining the Multicast frame.

More specifically, the present invention (as recited in independent claims and 15-18) takes advantage of a MAC layer that is Data Link layer (the second layer of the OSI model) having a re-transmission scheme for wireless communication such as IEEE802.11. For example, in IEEE802.11, when a transmitting terminal transmits a frame and a receiving terminal receives the frame correctly, the receiving terminal sends a frame (ACK frame) notifying the correct receipt to the transmitting terminal. If the transmitting terminal does not receive the ACK frame within a predetermined time period, the transmitting terminal re-transmits the same frame.

In general, the re-transmission processing is repeated multiple times until the frame is correctly received. However, the re-transmission at the MAC layer is performed only for Unicast. For a group address such as broadcast or Multicast, receivers do not send such an ACK frame.

In the Office Action, the Examiner relies on the combination of Tomohiko and Sharony for disclosing or suggesting all the features recited in independent claims 1 and 15-17; and the combination of Tomohiko, Sharony and Wakai for disclosing or suggesting the features of independent claim 18. However, the Applicants assert that no combination of the above cited prior art discloses or suggests the features now recited in independent claims 1 and 15-18 (as amended).

Tomohiko discloses a technology for receiving a Multicast frame and converting the received Multicast frame to a Unicast frame to be transmitted. In Tomohiko, however, Multicast data included in IP datagram is transmitted as Unicast IP datagram including a TCP frame. That is, Tomohiko discloses Unicast using re-transmission processing of TCP, and the TCP processing is performed at a layer higher than a layer of a communication protocol (IP) defining Multicast.

Thus, Tomohiko fails to disclose Unicast using re-transmission processing of a layer (namely, a MAC layer) lower than a layer of a communication protocol defining Multicast, as in the present invention (as recited in independent claims 1 and 15-18).

Sharony discloses a system and method for wireless network channel management that includes appending a data packet to a data stream queue ("DSQ"), wherein the DSQ has a priority level. The system and method disclosed in Sharony allocates a quantum of bandwidth to the DSQ and transmits the data packet as a function of the priority level and the quantum of bandwidth.

However, Sharony discloses Unicast at a MAC layer in a wireless communication path, which is more accurately related to a single wireless network. Therefore, it is not reasonable to combine Sharony (i.e., not related to Multicast/Unicast conversion) with Tomohiko, which is related to Multicast/Unicast conversion in an attempt to arrive at the present invention (as recited in independent claims 1 and 15-18).

Finally, Wakai discloses an in-flight passenger entertainment system that has a first digital network for communication among components of a headend system including a data server, media controller, one or more media servers, system interface unit, system manager unit and attendant control panel. The first digital network is preferably an ATM network with fiber optic cables used to carry the data, and the second digital network is preferably an IEEE 1394 serial bus network.

However, nothing in Wakai discloses or suggest implementing Unicast using re-transmission processing of a layer (namely, a MAC layer) lower than a layer of a communication protocol defining Multicast, as the present invention (as recited in independent claims 1 and 15-18).

Based on the above discussion, no combination of Tomohiko, Sharony and Wakai would result in, or otherwise render obvious, the features of independent claims 1 and 15-18 (as amended). Additionally, no combination of Tomohiko, Sharony and Wakai would result in, or otherwise render obvious, the features of claims 8, 9 and 13 at least by virtue of their dependencies (directly or indirectly) from independent claim 1.

In the Office Action, claims 2 and 4 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over Tomohiko, Sharony, and further in view of Rune (U.S. Publication No. 2006/0062187, hereinafter “Rune”); claim 3 has been rejected under 35 U.S.C. § 103(a) as being unpatentable over Tomohiko, Sharony, Rune, and further in view of Tomohiko U.S. Publication No. 2001/0018714, hereinafter “Tomohiko-US”); and claims 5 and 10 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over Tomohiko, Sharony, and further in view of Zisapel (U.S. Publication No. 2003/0195984, hereinafter “Zisapel”).

Additionally, claim 6 has been rejected under 35 U.S.C. § 103(a) as being unpatentable over Tomohiko, Sharony, Zisapel, and further in view of Alexander (U.S. Patent No. 7,411,901, hereinafter “Alexander”); claim 7 has been rejected under 35 U.S.C. § 103(a) as being unpatentable over Tomohiko, Sharony, Zisapel, Alexander, and further in view of Lipp (U.S.

Patent No. 6,751,219, hereinafter “Lipp”); claims 11 and 12 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over Tomohiko, Sharony, Zisapel, and further in view of Lipp and Alexander; and claim 14 has been rejected under 35 U.S.C. § 103(a) as being unpatentable over Tomohiko, Sharony, and further in view Wesley (U.S. Patent No. 6,076,114, hereinafter “Wesley”).

Claims 2-7, 10- 12 and 14 depend from independent claim 1. As noted above, Tomohiko and Sharony fail to disclose or suggest all the features in independent claim 1 (as amended). Moreover, Rune, Tomohiko-US, Zisapel, Alexander, Lipp and Wesley fail to overcome the deficiencies noted above in Tomohiko and Sharony. Accordingly, no combination of Tomohiko and Sharony in combination with Rune, Tomohiko-US, Zisapel, Alexander, Lipp or Wesley would result in, or otherwise render obvious, claims 2-7, 10-12 and 14 at least by virtue of their dependencies (directly or indirectly) from independent claim 1.

Furthermore, at least dependent claim 3 is also believed to be distinguished from the cited prior art on its own merit. In the Office Action, the Examiner alleges that Tomohiko discloses an IP address of a Multicast frame that is maintained in an Unicast frame (Fig. 4 of Tomohiko; and ¶[0059]-¶[0061]). However, Fig. 4 of Tomohiko merely discloses that an IP address of a Multicast frame is not maintained in a Unicast frame, but is maintained as data (i.e., encapsulated data). Therefore, Tomohiko is clearly different from the present invention (as recited in claim 3). Accordingly, dependent claim 3 is distinguished from the cited prior art on its own merit.

New claims 19-27 are also distinguishable from the cited prior art for at least the reasons noted below. Claims 19 and 20 are independent claims that include the features noted above in independent claims 1 and 15-18. That is, independent claims 19 and 20 both include the limitation “wherein the re-transmission processing is performed at a layer lower than a layer of a communication protocol defining the Multicast frame.” Accordingly, independent claims 19 and 20 are distinguished for the cited prior for similar reasons noted above for independent claims 1 and 15-18.

Claims 21-27 depend respectively from independent claims 1 and 15-20. Accordingly, claims 21-27 are distinguished from the cited prior art at least by virtue of their respective dependencies (directly or indirectly) from independent claims 1 and 15-20.

In light of the above, the Applicants submit that all the pending claims are patentable over the prior art of record. The Applicants respectfully request that the Examiner withdraw the

rejections presented in the outstanding Office Action, and pass the present application to issue. The Examiner is invited to contact the undersigned attorney by telephone to resolve any remaining issues.

Respectfully submitted,

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